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ANTS, ELEPHANT GUNS, AND STATUTORY SUBJECT MATTER

Kristen Osenga[†]

ABSTRACT: *Questions about whether software qualifies for patent protection are becoming increasingly more prevalent, despite the fact the issue seemed settled. The Supreme Court has indicated its interest in the topic and the U.S. Patent and Trademark Office—which had previously been liberally issuing patents in the computer-related arts—now appears to be leading the groundswell against the subject-matter eligibility of these inventions, rejecting an increasing number of applications in this area for lack of statutory subject matter. Despite the broad definitions of patentable subject matter provided by the Constitution, Patent Act, and Supreme Court, the Patent Office has grafted various additional requirements onto the statute, the most recent being the requirement that the invention be within the “technological arts.” In an effort to clarify the official Patent Office position, the Board of Patent Appeals and Interferences recently suppressed the notion of a separate “technological arts” inquiry. The Patent Office shortly thereafter issued interim guidelines for examination of patent applications for patentable subject matter, paying particular attention to computer-related inventions.*

The statutory subject matter issue is not as complex as the Patent Office’s activity suggests. Rather, in promulgating these guidelines, the Patent Office is trying to kill an ant with an elephant gun, over-complicating what should be an essentially simple question. This Article shows that the Patent Office, the courts, and even some commentators, have used subject-matter rejections as a way to avoid tackling policy or practical issues that should be handled through other means; the rejections are merely proxies for inquiries that should more appropriately be made under other statutory patentability requirements. To prevent the Supreme Court

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from making the same mistake when it takes up the issue, the Patent Office must be disarmed by removing any software-specific inquiry from the determination of patentable subject matter.

I. INTRODUCTION

Despite any negativity the dot.com bust may have cast over the software industry,¹ it is clear that software today has been integrated into essentially all areas of everyday life.² Software is accessed daily on personal computers and over the Internet, at home and at the office, for both leisure and business, and in industries from retail to manufacturing to education to food service. At work, we use software to enhance our communication, optimize our distribution systems, facilitate visual presentations and virtual training simulations, and automate our payroll and accounting systems. At home, we use software to help us manage our appointments, book our vacations, monitor our children, shop in our pajamas, and, last but not least, provide abundant opportunities to waste our free time. Even on the rare occasions when we excise ourselves from our desktop, laptop, and handheld computer systems, we are still constantly interacting with software. It is present, for example, in the global positioning system in our cars, the self-checkout kiosks at the grocery store, the battery-management algorithms in our cell phones, and the setback feature in our home thermostats. Given the seemingly infinite number of software applications in our daily lives, it should not then be surprising that the software industry is one of the most important economic sectors.³

While the pervasiveness of software is indisputable, the question remains whether and to what extent software-related inventions should be protected by the patent system. For much of history, commentators, courts, and people in the computer and software industries believed that software was

1. At various points in this paper, I may appear to conflate software and Internet applications. While all Internet applications are software, only some software programs are Internet applications. With the ubiquity of the Internet, the conflation is not unfair; however, this conflation should not be seen as an exclusion of non-Internet software applications, merely as a shorthand notation for all software-related inventions. Yet another conflation is the relationship between software-related inventions and business methods. Although these two categories are wholly separate, in that you can have a software-related invention that does not include a business method and you can have a business method that is not implemented via software, the criticisms and concerns are similar and any decision affecting one is likely to affect the other. Moreover, most business methods are at least contemplatively implemented via software.

2. Bradford L. Smith & Susan O. Mann, *Innovation and Intellectual Property Protection in the Software Industry: An Emerging Role for Patents?*, 71 U. CHI. L. REV. 241, 241 (2004).

3. *Id.*

not eligible for patenting.⁴ One justification for this idea was that patent protection would harm both the software industry and society as a whole.⁵ Yet, despite the lack of patent protection in its early stages, the software sector flourished.⁶

Despite the high level of innovation in the absence of patent eligibility, inventors and patent attorneys continued, and still persist, to push the envelope of the patent system, maintaining that software inventions require adequate legal protection.⁷ Although early on the U.S. Patent and Trademark Office (“Patent Office”) vigorously maintained that software-related inventions were not eligible for patenting, a string of Supreme Court cases in the 1970s and 1980s opened, or at least set ajar, the Patent Office door to the software industry.⁸ These cases were followed by a 1999 opinion of the United States Court of Appeals for the Federal Circuit (“Federal Circuit”) in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,⁹ suggesting the patent eligibility of business method inventions, which essentially threw the Patent Office doors wide open for all software-related inventions.¹⁰

Following the *State Street* decision, patent applications for computer software, Internet applications, and business methods flooded the Patent

4. Throughout this Article, I will use the term “patent eligible” to refer to whether the application describes statutory subject matter under 35 U.S.C. § 101—the critical question is whether the invention *may* be patented. See 35 U.S.C. § 101 (2000) (Inventions Patentable). In contrast, the term “patentable” refers to the other requirements under Title 35, such as utility, novelty, and nonobviousness—the question here is whether a patent *should* be granted.

5. Some seventeen years ago, Professor Pamela Samuelson argued against software patents, noting that “[p]redictions that patents may be harmful to the software industry, computer science, mathematics, or society as a whole have been quite frequent, even from some of the most well-known people in the software and computer science fields.” Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025, 1133 (1990).

6. In recent times, Bradford Smith and Susan Mann of Microsoft have credited patent law for at least a portion of the progress of software innovation. See Smith & Mann, *supra* note 2, at 241 (“Intellectual property (IP) laws have had an important impact on the software industry’s success.”).

7. See, e.g., Harry First, *Microsoft and the Evolution of the Intellectual Property Concept*, 2006 WIS. L. REV. 1369, 1378 (“Software . . . is as close to pure intellectual property as any product can be. It needs some form of legal protection if society is to expect people to devote their energies and capital to its production.”) (footnote omitted).

8. See discussion of *Gottschalk v. Benson*, *Parker v. Flook*, and *Diamond v. Diehr*, *infra* Part II.A, for a more complete discussion of the Supreme Court’s decisions that clarified the patent eligibility of software.

9. 149 F.3d 1368 (Fed. Cir. 1998).

10. *Id.* at 1375–77; see discussion of *State Street*, *infra* notes 108–15. Oddly, the Patent Office also played an important part in this new acceptance of software-related inventions, as the *State Street* decision involves an issued patent, but the Federal Circuit’s opinion confirmed and expanded the idea.

Office. Although for a few years the applications worked their way quietly through the Patent Office, resulting in issued patents, the scene is quickly changing—a number of these applications have now recently been rejected for lack of statutory subject matter under 35 U.S.C. § 101.¹¹ This movement towards limiting, or perhaps even eliminating, the patent-eligibility of software-related inventions is not limited to the Patent Office. Recent evidence suggests that the courts, including the Supreme Court, are poised to reconsider the issue in the near future. For example, in the Supreme Court oral argument held recently in *Microsoft Corp. v. AT&T Corp.*,¹² a case focused not on subject-matter eligibility but on the extraterritorial application of U.S. patent law, multiple Justices asked questions relating to the scope of intellectual property protection that ought to be afforded to software.¹³ Similarly, Justice Breyer, in his dissent from the Court's dismissal of the *Laboratory Corp. of American Holdings v. Metabolite Laboratories, Inc.*¹⁴ case, questioned whether business methods and software are eligible for patent protection.¹⁵ And most recently, the Federal Circuit laid a solid foundation for Supreme Court review of subject-matter eligibility by issuing two opinions, *In re Nuijten*¹⁶ and *In re Comiskey*,¹⁷ that address the issues head-on and seemingly change the § 101 landscape. It seems merely a matter of time until the Supreme Court grants certiorari in a case that squarely addresses statutory subject matter in the computer-related arts. Until the Court does address the issue head-on, however, the Patent

11. One study asserts that, in 2005, applications assigned to the U.S. Patent Office Technology Center 2100 (Computer Architecture, Software, and Information Security) experienced an increase in § 101 subject-matter rejections of more than 200% over similar rejections in 2004. Steven M. Greenberg, *The Inconsistent Treatment of Computer Software as Patentable Subject Matter*, 11 J. TECH. L. & POL'Y 77, 87 (2006). The reasons for these rejections typically fell into one of two categories: failure to meet the technological arts test or failure under the mental steps test. *Id.* at 88. A discussion of these tests follows, *infra* Part II.B and Part IV.C.b.3.

12. 127 S. Ct. 1746 (2007).

13. See, for example, Justice Stevens' question directed to Daryl Joseffer, Esq., Assistant to the Solicitor General, Department of Justice: "I want to ask you one yes or no question. In your view is software patentable?" Transcript of Oral Argument at 27, *Microsoft Corp. v. AT&T Corp.*, 127 S. Ct. 1746 (2007) (No. 05-1056).

14. 126 S. Ct. 2921 (2006).

15. *Id.* at 2927 (Breyer, J., dissenting); see also *In re Comiskey*, 499 F.3d 1365 (Fed. Cir. 2007) (raising § 101 issues *sua sponte* at oral argument and requesting additional briefing on the topic in a business method case).

16. 500 F.3d 1346, 1353–58 (Fed. Cir. 2007) (interpreting the four statutory categories of 35 U.S.C. § 101 and determining that signal claims do not fit within any of these four categories).

17. *In re Comiskey*, 499 F.3d at 1378–79 (Fed. Cir. 2007) (determining that certain business method claims that can be performed entirely by a human being do not fit within the enumerated categories of § 101).

Office seems content to lead the groundswell against software patent eligibility.

The Patent Office's opposition to patent eligibility for computer-related inventions is exemplified in *Ex parte Lundgren*,¹⁸ a case from the Board of Patent Appeals and Interferences ("BPAI"), and the recently issued interim guidelines for determining whether an invention comprises statutory subject matter.¹⁹ The reason given by the Patent Office for promulgating the guidelines was the filing of "increasing numbers of applications . . . that raise subject-matter eligibility issues."²⁰ Although the guidelines eviscerate many of the subject-matter eligibility tests found inapplicable by the courts and the BPAI, the Patent Office has grafted a physicality requirement onto the examination of software-related inventions that is expressly directed at software and business methods and is bound to lead to an increased number of statutory subject-matter rejections.²¹ In turn, the Federal Circuit has now sanctioned this notion of physicality in the recent *In re Comiskey* opinion, where it stated that "processes involving mathematical algorithms used in computer technology"—essentially, software—may be patentable so long as "they claimed practical applications and *were tied to specific machines*."²²

The promulgation of these guidelines by the Patent Office is equivalent to trying to kill an ant with an elephant gun—overcomplicating what is essentially a simple question. First, the question of subject-matter eligibility for software-related inventions should be considered an ant, or maybe an anthill, rather than the ever-growing mountain that many parties, including the Patent Office, view it to be. Second, the Patent Office's interim examination guidelines approach the problem of software patent applications with a rather unnecessary elephant gun. The Patent Office and some commentators are using § 101 rejections as a means to avoid tackling other policy or practical issues that should be handled through other

18. B.P.A.I. No. 2003-2088, 76 U.S.P.Q.2d 1385 (Sept. 28, 2005); *see also Ex parte Bilski*, B.P.A.I. No. 2002-2257, slip op. at 32, 2006 Pat. App. LEXIS 51, *39 (Sept. 26, 2006) (rejecting a business method invention for lack of statutory subject matter).

19. *See* U.S. Patent & Trademark Office, Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (Oct. 2005), *available at* http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf [hereinafter 2005 Guidelines].

20. *Id.* at 1.

21. *Id.* at 2, 19, 42 (suggesting that subject-matter-eligible inventions either will transform an article or physical object to another state or thing or will produce a useful, concrete, and tangible result, both having an element of physicality associated). The 2005 Guidelines and the physicality requirements implicated by the guidelines are discussed in greater detail in Part IV, *infra*.

22. *See In re Comiskey*, 499 F.3d at 1377 (emphasis added).

avenues. The rejections thus serve as proxies for inquiries that are made more appropriately under other requirements of patentability, such as utility, novelty, nonobviousness, adequate written description, and enablement.²³ There is no reason to treat the inquiry into subject-matter eligibility of software-related inventions any differently than applications directed towards other types of inventions. Subjecting software patent applications to the same standards of eligibility and patentability, without the extra layers imposed by the guidelines, comports with both policy and precedent.

In Part II of this Article, I trace the history of subject-matter eligibility for software-related inventions, including a discussion of the previously mentioned Supreme Court and Federal Circuit opinions that paved the way for patenting software. I also examine the BPAI decision in *Ex parte Lundgren* and the details of the interim examination guidelines issued by the Patent Office thereafter. In Part III, I explain why the question of subject-matter eligibility of software applications is like an ant—a tiny and inconsequential creature that should not concern us much. In Part IV, I tackle the other side of the analogy and explain why the Patent Office's guidelines are akin to approaching the question of eligible subject matter with an elephant gun—a bit of overkill. Finally, in Part V, I propose that the appropriate process for examining patent applications directed towards software-related inventions is precisely the same as the process used for other technological areas. In short, the question of subject-matter eligibility for any invention is essentially *pro forma*, and whether a patent is granted for a particular invention should be based on the application meeting the requirements of patentability provided by 35 U.S.C. §§ 102, 103, and 112.

II. HISTORY OF THE SUBJECT-MATTER ELIGIBILITY OF COMPUTER-RELATED INVENTIONS

For much of history, software-related inventions were believed by the Patent Office, the courts, and commentators to be ineligible subject matter for patenting.²⁴ Subject-matter eligibility is derived from the Constitution and the Patent Act, both of which take a very expansive view of eligible subject matter. The Constitution authorizes patents on inventions that

23. These patentability requirements are specifically found at 35 U.S.C. § 101 (utility), § 102 (novelty), § 103 (nonobviousness), and § 112 (adequate written description and enablement). See 35 U.S.C. §§ 101–103, 112 (2000).

24. See, e.g., Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155, 1160–61 (2002).

promote the “useful arts,”²⁵ which has been interpreted in modern times to mean the “technological arts.”²⁶ The Patent Act is equally broad, permitting a patent to be granted to anyone who “invents or discovers any new and useful process, machine, manufacture, or composition of matter.”²⁷ At least in theory, any invention that fits somewhere within these four categories and is not one of three well-accepted exceptions—natural phenomena, laws of nature, or abstract ideas—is eligible subject matter for patenting.²⁸

Despite the seeming clarity of the authorizing provisions in the Constitution and the Patent Act, however, it would take the courts a few decades to meander through a number of unfortunate opinions and reach this simple conclusion. Although the courts and the Patent Office had, until recently at least, reached the point where computer-related inventions were considered eligible for patent protection, these early cases are important to explain the genesis of many of the proxy-type inquiries that are being unnecessarily and erroneously applied to these applications even today.

A. Judicial Interpretation of Patent Eligibility

The earliest case in which the Supreme Court considered the subject-matter eligibility of software-related inventions was the 1972 case *Gottschalk v. Benson*.²⁹ *Benson* involved a method for converting binary-coded decimal numbers to pure binary numbers.³⁰ The method was not limited to any particular technology, apparatus, or end use.³¹ The examiner rejected the claims as nonstatutory subject matter under § 101 because the

25. U.S. CONST. art. I, § 8, cl. 8 (“The Congress shall have Power . . . [t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”).

26. See, e.g., *In re Comiskey*, 499 F.3d at 1375 (citing *Paulik v. Rizkalla*, 760 F.2d 1270, 1276 (Fed. Cir. 1985) (en banc)) (equating “useful arts” with “technological innovation”); *In re Waldbaum*, 457 F.2d 997, 1003 (C.C.P.A. 1972); Alan L. Durham, “*Useful Arts*” in the *Information Age*, 1999 BYU L. REV. 1419, 1437. Whether “technological arts” should be defined expansively or narrowly has been the subject of debate, but includes at least industrial processes and physical artifacts. See Durham, *supra* at 1451.

27. 35 U.S.C. § 101 (2000).

28. See *In re Alappat*, 33 F.3d 1526, 1542–43 (Fed. Cir. 1994) (en banc) (“The plain and unambiguous meaning of § 101 is that any new and useful process, machine, manufacture, or composition of matter . . . may be patented if it meets the requirements for patentability set forth in Title 35. . . . Despite the apparent sweep of § 101, the Supreme Court has held that certain categories of subject matter are not entitled to patent protection. . . . [T]here are three categories of subject matter for which one may not obtain patent protection, namely ‘laws of nature, natural phenomena, and abstract ideas.’” (internal citations omitted)).

29. 409 U.S. 63 (1972).

30. *Id.* at 64.

31. *Id.*

claims described mental processes or mathematical steps, and the BPAI affirmed.³² The Court of Customs and Patent Appeals (“CCPA”) reversed the Board, finding that the claims were directed to computer hardware, negating the mental-processes rejection, and finding that any mathematical algorithm would have practical use only as part of the computer technology.³³ The Patent Office appealed the CCPA’s decision to the Supreme Court, which reversed, finding the subject matter of the claims ineligible for patent protection.³⁴ In particular, the Court was influenced by the fact that the claims “were not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use.”³⁵ Rather, the Court found the invention was an algorithm or abstract idea, an exception to subject matter that would otherwise fit within the statutorily defined eligible subject-matter categories.³⁶ The Court also expressed concern that patenting an invention of this type “would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.”³⁷ The Court’s holding—that any invention that would preempt the use of a mathematical algorithm does not comprise statutory subject matter—is a fair interpretation of the law. However, this is not how the Patent Office applied the holding of the *Benson* Court. Rather, the Patent Office interpreted this case as holding that software inventions were unpatentable subject matter per se.³⁸

The Supreme Court next took up eligible subject matter in *Parker v. Flook*.³⁹ During the process of catalytic conversion of hydrocarbons, a set of conditions, such as temperature, pressure, and flow rate, is constantly monitored.⁴⁰ If any of these variables exceeds a preset alarm limit, it may indicate an abnormal condition.⁴¹ While fixed alarm limits are appropriate for steady-state operation, transient operation may require the alarm limits to be periodically updated.⁴² Flook’s invention was directed toward a method for updating the variable alarm limits and improved upon the prior art through the use of a particular algorithm for this recalculation of the

32. *In re Benson*, 441 F.2d 682, 684 (C.C.P.A. 1971).

33. *Id.* at 687–88.

34. *Gottschalk*, 409 U.S. at 63.

35. *Id.* at 64.

36. *Id.* at 67–68.

37. *Id.* at 72.

38. See, e.g., Robert Greene Sterne & Lawrence B. Bugaisky, *The Expansion of Statutory Subject Matter Under the 1952 Patent Act*, 37 AKRON L. REV. 217, 221 (2004).

39. 437 U.S. 584 (1978).

40. *Id.* at 585.

41. *Id.*

42. *Id.*

limits.⁴³ The examiner rejected the claims as being directed to ineligible subject matter because the resulting patent would be a patent on the mathematical formula itself; the BPAI affirmed, adding that the only point of novelty of the invention was the algorithm.⁴⁴ The CCPA reversed, reasoning that the *Benson* holding only excluded mathematical formulas per se and that the mere solution of the algorithm included in Flook's claims would not infringe the claims themselves.⁴⁵ The Supreme Court again reversed the CCPA and found the subject matter to be ineligible for patenting.⁴⁶ The Court reasoned that because mathematical algorithms are unpatentable and because the sole novel feature of Flook's invention was its algorithm, the application failed to describe eligible subject matter.⁴⁷ Moreover, the Court stated that the fact that Flook's invention was more than just the algorithm, that it involved post-solution steps, was insufficient to distinguish this case from *Benson*.⁴⁸ At the time, this decision simply reinforced the Patent Office's per se ban on patenting of software inventions. Now, however, the *Flook* opinion is making an interesting comeback as support for rejecting subject matter as ineligible under § 101.⁴⁹

The last Supreme Court case to speak to subject-matter eligibility of software-related inventions was *Diamond v. Diehr*.⁵⁰ The invention in *Diehr* was directed towards a process for molding and curing rubber.⁵¹ To achieve accurately cured rubber, the molding press must be opened at a certain time, calculated using the Arrhenius equation.⁵² The invention provided a method for repeatedly measuring the conditions of the curing rubber, applying the Arrhenius equation to the measured data, and determining the time remaining until the press should be opened.⁵³ The method was to be performed by a computer, and when the ideal curing time had been reached, the computer would signal the press to open automatically.⁵⁴

43. *Id.*

44. *Id.* at 587.

45. *In re Flook*, 559 F.2d 21, 23 (C.C.P.A. 1977).

46. *Parker*, 437 U.S. at 596.

47. *Id.* at 593–94.

48. *See id.* at 590 (“The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula. . .”).

49. *See, e.g., In re Comiskey*, 499 F.3d 1365, 1376–77 (Fed. Cir. 2007) (adopting a Patent Office argument based on *Flook* in finding ineligible subject matter for a business method that was not tied to a specific machine).

50. 450 U.S. 175 (1981).

51. *Id.* at 177.

52. *Id.* at 177–78.

53. *Id.* at 178–79.

54. *Id.* at 179.

Although the invention in *Diehr* looks, at least superficially, similar to *Flook*—data are measured, data are manipulated using a mathematical algorithm or formula, and the output of the algorithm is used for some industrial purpose—the outcome of the case was diametrically opposite. The Supreme Court held the software-related invention in *Diehr* to be patent-eligible subject matter, even though the invention included the presence of a mathematical algorithm or equation.⁵⁵ The Court strained to square this decision with *Flook* and *Benson*, stating that the inventions in those cases were simply mathematical formulas, while *Diehr* was an invention for curing rubber.⁵⁶ The question to determine whether an invention comprises eligible subject matter, the Court noted, is not whether the invention includes a mathematical algorithm or has software components, but rather whether such a claim containing a mathematical formula or algorithm “implements or applies that formula [or algorithm] in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (for example, transforming or reducing an article to a different state or thing).”⁵⁷ This transformation requirement, introduced by the *Diehr* case, is still present in the subject-matter eligibility calculus.⁵⁸

Perhaps the story would have ended there, but the Patent Office continued (and continues) to issue rejections based on lack of eligible subject matter, and the Federal Circuit has continued this path of ruling, in a rather haphazard fashion, on the same. In fact, the Federal Circuit’s jurisprudence on the subject-matter eligibility of software-related inventions is no less mind-boggling. Although any number of cases would provide the same illustration, two in particular are exemplary: *In re Grams*⁵⁹ and *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*⁶⁰ *Grams* involved “a method of testing a complex system to determine whether the system condition is normal or abnormal and, if it is abnormal, to determine the cause of the abnormality.”⁶¹ The method comprised the steps of gathering data about the system and then analyzing the data to determine the condition.⁶² The examiner rejected and the BPAI affirmed that the

55. *Id.* at 191–93.

56. *See id.* at 185–87. The Supreme Court also silently overruled *Flook*, noting that “[i]t is inappropriate to dissect the claims into old and new elements and then to ignore the presence of old elements in the analysis.” *Id.* at 188.

57. *Id.* at 191–92.

58. *See infra* Part IV.C.1.

59. 888 F.2d 835 (Fed. Cir. 1989).

60. 958 F.2d 1053 (Fed. Cir. 1992).

61. *In re Grams*, 888 F.2d at 836.

62. *Id.* at 837.

claims were either mathematical algorithms or methods of doing business, and as such, were ineligible subject matter for patenting.⁶³ The Federal Circuit upheld the determination of ineligible subject matter because the invention was merely a mathematical algorithm.⁶⁴ The lone physical step in Grams's process was the initial gathering of data; the court held that "[t]he presence of a physical step in the claim to derive data for the algorithm will not render the claim statutory [subject matter]."⁶⁵

In contrast, the court reached a seemingly opposite result in *Arrhythmia Research*. The invention in this case analyzed electrocardiograph ("ECG") signals to determine characteristics of heart function.⁶⁶ In particular, the claimed method involved converting an ECG signal, filtering the signal subject to an algorithm, and comparing the resulting signal to certain predetermined levels to determine if the patient was at a higher risk for a certain cardiac condition.⁶⁷ The Patent Office issued the patent without question.⁶⁸ However, in an infringement litigation trial, a district court found the patent to be invalid for lack of eligible subject matter under § 101.⁶⁹ Despite the lack of any traditionally physical step, the Federal Circuit held the claims were directed toward statutory subject matter and reversed.⁷⁰ The court reasoned that the "claimed steps of 'converting', 'applying', 'determining', and 'comparing' are physical process steps that transform one physical, electrical signal into another."⁷¹ Although the *Arrhythmia Research* court attempted to distinguish *Grams* on the grounds that the claims in *Grams* would preempt use of the algorithm in situations beyond the contemplation of the inventor,⁷² the *Grams* opinion makes it clear that the court was influenced by the lack of physicality.⁷³ This physicality requirement, that the court found lacking in *Grams* but present

63. *Id.* at 836.

64. *Id.* at 841. Because the court found the claims to be nonstatutory subject matter as a mathematical algorithm, the court did not reach the Patent Office's alternative basis of ineligibility due to being a business method. *Id.*

65. *Id.* at 840.

66. *Arrhythmia Research Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1054 (Fed. Cir. 1992).

67. *Id.* at 1055.

68. *Id.*

69. *Id.* at 1054.

70. *Id.* at 1059, 1061.

71. *Id.* at 1059.

72. *Id.* ("The claims do not encompass subject matter transcending what [the inventor] invented, as in . . . *Grams* (invention had application to 'any complex system, whether it be electrical, mechanical, chemical or biological, or combinations thereof')." (citation omitted)).

73. See discussion of *In re Grams*, *supra* notes 59, 61–65 and accompanying text.

in *Arrhythmia Research*, remains in the present statutory subject-matter inquiry.⁷⁴

The court's reliance on physical transformation continued in *In re Alappat*.⁷⁵ The invention in *Alappat* was directed towards "a means for creating a smooth waveform display in a digital oscilloscope."⁷⁶ Specifically, Alappat invented an anti-aliasing system or algorithm that illuminated the display pixels at varying intensities to reduce discontinuity and jaggedness in the waveform.⁷⁷ Although Alappat did not claim the algorithm directly, the claims included a "rasterizer" with means for performing the various steps of the algorithm.⁷⁸ The examiner rejected these claims under § 101 for failure to recite statutory subject matter.⁷⁹ A three-member panel of the BPAI reversed the examiner's rejection, finding the claims directed towards a machine, one of the clearly enumerated categories of statutory subject matter.⁸⁰ The BPAI then took the case under reconsideration by an expanded eight-member panel, which affirmed the examiner's § 101 rejection because each of the claims recited only mathematical algorithms.⁸¹ The Federal Circuit reversed the BPAI decision, stating that, although many of the elements recited performed mathematical calculations, "the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine. . . . This is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result."⁸² This requirement of a useful, concrete, and tangible result also remains a critical factor in the present subject-matter eligibility inquiry.⁸³

As a final parting shot, the *Alappat* court ended the opinion with the following endorsement, dicta though it may be, of the patent eligibility of software-related inventions:

Under the Board majority's reasoning, a programmed general purpose computer could never be viewed as patentable subject

74. See *infra* Part III.

75. 33 F.3d 1526 (Fed. Cir. 1994) (en banc). Interestingly, this case was not taken en banc to consider the very important issue of statutory subject matter, but rather to clarify questions with respect to the court's jurisdiction over decisions of the BPAI. *Id.* at 1530.

76. *Id.* at 1537.

77. *Id.*

78. *Id.* at 1539.

79. *Id.*

80. *Id.*

81. *Id.* at 1539-40.

82. *Id.* at 1544.

83. See *infra* Part IV.C.2.

matter under § 101. This reasoning is without basis in the law. The Supreme Court has never held that a programmed computer may never be entitled to patent protection. Indeed, the *Benson* court specifically stated that its decision therein did not preclude “a patent for any program servicing a computer.” Consequently, a computer operating pursuant to software *may* represent patentable subject matter, provided, of course, that the claimed subject matter meets all of the other requirements of Title 35. In any case, a computer, like a rasterizer, is apparatus not mathematics.⁸⁴

Shortly after the *Alappat* decision, in 1995, the Patent Office proposed Examination Guidelines for Computer-Implemented Inventions in response to “recent changes in the law that governs the patentability of computer-implemented inventions.”⁸⁵ After a period for comments, the Patent Office then issued its Examination Guidelines for Computer-Related Inventions (“1996 Guidelines”) “to assist Office personnel in the examination of applications drawn to computer-related inventions.”⁸⁶ The basic steps provided by the 1996 Guidelines instructed the examiner to 1) determine what the applicant has invented and is seeking to patent;⁸⁷ 2) conduct a thorough search of the prior art;⁸⁸ 3) determine whether the invention claims patentable subject matter under § 101;⁸⁹ 4) evaluate the application for § 112 compliance;⁹⁰ 5) determine whether the invention is new (§ 102) and nonobvious (§ 103);⁹¹ and 6) communicate the findings, conclusions, and bases to the applicant.⁹²

The 1996 Guidelines then provided some instructions explicitly related to examination of software-related inventions. For example, the 1996 Guidelines directed the examiner to no longer begin examination by determining if the claim recites a mathematical algorithm, but to focus

84. *In re Alappat*, 33 F.3d at 1545 (internal citation omitted).

85. Request for Comments on Proposed Examination Guidelines for Computer-Implemented Inventions, 60 Fed. Reg. 28,778, 28,778 (June 2, 1995); *see also* U.S. Patent and Trademark Office, Off. Gazette Notices, Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (Nov. 22, 2005), <http://www.uspto.gov/go/og/2005/week47/patgupa.htm> (“In the mid-1990’s, the [Patent Office] sought to clarify the legal requirements for statutory subject matter with regard to computer-related inventions.”).

86. Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. 7478, 7479 (Feb. 28, 1996).

87. *Id.* at 7479–80.

88. *Id.* at 7480–81. The placement of this step as second, prior to the determination of eligible subject matter, is puzzling. *See infra* note 176 and accompanying text.

89. Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. at 7481–86.

90. *Id.* at 7486–87.

91. *Id.* at 7487.

92. *Id.*

instead on the invention as a whole.⁹³ Further, under the third step, the examiner was to classify the invention into one of the four enumerated categories of statutory subject matter under § 101 and then to determine if the invention fit into one of the three nonstatutory exceptions.⁹⁴ In so determining, the 1996 Guidelines looked to the *In re Beauregard*⁹⁵ decision in favoring software-related inventions when the software was claimed in an article of manufacture format.⁹⁶ In *Beauregard*, the Patent Office conceded that “computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter under 35 U.S.C. § 101.”⁹⁷

The 1996 Guidelines also set forth a classification scheme based on descriptive material.⁹⁸ Descriptive material is either functional or nonfunctional; the former includes “data structures and computer programs which impart functionality when encoded on a computer-readable medium,” while the latter includes anything else.⁹⁹ Nonfunctional descriptive material, such as mere data, was always considered nonstatutory because it does not impart functionality.¹⁰⁰ Functional descriptive material, so long as it was claimed as a computer-readable medium encoded with a computer program, was generally considered to be statutory.¹⁰¹

Although the 1996 Guidelines were criticized for failing to add clarity to the topic,¹⁰² the guidelines were also praised for minimizing the inquiry into subject-matter eligibility.¹⁰³ For this reason, examiners were taking a more liberal view of subject-matter eligibility for software-related inventions, so

93. *Id.* at 7479.

94. *Id.*

95. 53 F.3d 1583 (Fed. Cir. 1995).

96. Although the 1996 Guidelines do not specifically reference the *Beauregard* case, these claims that recite an invention embodied in a computer-readable medium are “now commonly referred to as ‘Beauregard claims’” and are “readily allowed by the PTO as long as they satisfy the [other requirements of patentability.]” Daniel Lin, Matthew Sag & Ronald S. Laurie, *Source Code Versus Object Code: Patent Implications for the Open Source Community*, 18 SANTA CLARA COMPUTER & HIGH TECH. L.J. 235, 235 (2002).

97. *In re Beauregard*, 53 F.3d at 1584.

98. Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. at 7481.

99. *Id.* (footnote omitted).

100. *See id.*

101. *Id.*

102. *See* Robert A. Kreiss, *Patent Protection for Computer Programs and Mathematical Algorithms: The Constitutional Limitations on Patentable Subject Matter*, 29 N.M. L. REV. 31, 54 (1999); Mark A. Lemley & David W. O'Brien, *Encouraging Software Reuse*, 49 STAN. L. REV. 255, 283–84 (1997).

103. Kreiss, *supra* note 102, at 54 (citing Julie E. Cohen, *Reverse Engineering and the Rise of Electronic Vigilantism: Intellectual Property Implications of “Lock-Out” Programs*, 68 S. CAL. L. REV. 1091, 1162 n.369 (1995)).

long as they were claimed in the preferred format.¹⁰⁴ One area where the 1996 Guidelines did not offer any additional information for examiners was in the area of business methods,¹⁰⁵ which can be considered a particular subset of software inventions.¹⁰⁶ Business methods challenge the traditional notion that patent-eligible inventions must have some sort of physical aspect because business methods often revolve purely around the handling and processing of intangible data.¹⁰⁷ Fortunately, it was not long after the issuance of the 1996 Guidelines that the Federal Circuit spoke definitively on the matter of patent eligibility for business methods and gave us the widespread interpretation of statutory subject matter that has been the rule until quite recently.

The invention in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*¹⁰⁸ was a data processing system for implementing a hub and spoke investment structure, where mutual funds (spokes) pool their assets in a portfolio (hub) which was then organized as a partnership, permitting advantages associated with the economies of scale and the tax advantages of partnership.¹⁰⁹ Although the examiner contemplated rejecting the claims for lack of statutory subject matter under § 101, the examiner allowed the application once the method claims were cancelled, leaving only system claims.¹¹⁰ After the patent issued, in a trial for patent infringement, the district court held otherwise, finding the patent invalid for lack of eligible

104. See Vincent Chiappetta, *Patentability of Computer Software Instruction as an "Article of Manufacture:" Software as Such as the Right Stuff*, 17 J. MARSHALL J. COMPUTER & INFO. L. 89, 126 (1998).

105. Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. at 7479 ("Office personnel have had difficulty in properly treating claims directed to methods of doing business. Claims should not be categorized as methods of doing business. Instead, such claims should be treated like any other process claims, pursuant to these Guidelines when relevant.").

106. There is no generally accepted definition of a "business method." John R. Allison & Starling D. Hunter, *On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods*, 21 BERKELEY TECH. L.J. 729, 730 n.1 (2006). However, when people refer to business method patents, they often refer to those methods embodied in software, such methods being "the most important and controversial." *Id.* Business methods can be considered a subset of software-related inventions. *Id.* That being said, there are business method patents that are not embodied in software; the analysis for these, however, is not markedly different than that of software-related business method inventions.

107. See, e.g., Richard S. Gruner, *Intangible Inventions: Patentable Subject Matter for an Information Age*, 35 LOY. L.A. L. REV. 355, 357–60 (2002).

108. 149 F.3d 1368 (Fed. Cir. 1998).

109. *Id.* at 1370.

110. See *id.* at 1371. Because of this, the bulk of the *State Street* opinion that relates to business method claims is actually dicta. The *AT&T Corp. v. Excel Communications, Inc.* opinion confirms head-on the patentability of business methods. 172 F.3d 1352 (Fed. Cir. 1999).

subject matter.¹¹¹ Specifically, the district court found that the claims were not eligible for patenting because they fell within either the mathematical algorithm exception or the business method exception.¹¹² With respect to the mathematical algorithm argument, the Federal Circuit took its logic in *Arrhythmia Research* and *Alappat* one step further and stated that the transformation of data by a machine through a series of mathematical calculations into a final result constitutes a practical application of the algorithm, because it produces a “useful, concrete, and tangible result.”¹¹³ As to the business method exception, the court dismissed this argument rather quickly by denying the very existence of such a test: “We take this opportunity to lay this ill-conceived exception [for business methods] to rest.”¹¹⁴

The court also took the opportunity to reiterate the breadth of patent-eligible subject matter. First, the court noted that “[t]he plain and unambiguous meaning of § 101 is that any invention falling within one of the four stated categories of statutory subject matter may be patented, provided it meets the other requirements for patentability set forth in Title 35.”¹¹⁵ Because Congress used the term “any,” and the Supreme Court acknowledged that § 101 was to extend to “anything under the sun that is made by man,”¹¹⁶ the Federal Circuit stated that it is improper to read any limitations into § 101 where Congress did not so intend.¹¹⁷

The *State Street* opinion was followed by *AT&T Corp. v. Excel Communications, Inc.*,¹¹⁸ confirming business method patent eligibility. Until late 2007, these cases represented the last major statements by the Federal Circuit on the subject-matter eligibility of software-related inventions. The opinions hold that there should really never be a § 101 rejection of these applications so long as data transformation is present and the invention produces the requisite useful, concrete, and tangible result.¹¹⁹ And yet, the Patent Office is clearly not convinced,¹²⁰ and, apparently, neither are the courts.¹²¹ The BPAI decision in *Ex parte Lundgren*¹²² and the

111. *State Street*, 149 F.3d at 1370.

112. *Id.* at 1372.

113. *Id.* at 1373.

114. *Id.* at 1375.

115. *Id.* at 1372.

116. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

117. *State Street*, 149 F.3d at 1373.

118. 172 F.3d 1352 (Fed. Cir. 1999).

119. *See generally id.*

120. *See supra* note 105 and accompanying text.

121. In perhaps a foreshadowing of things yet to come, the Supreme Court has recently raised some flags about the future of software patentability. *See, e.g.,* *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 126 S. Ct. 2921, 2927 (2006) (Breyer, J., dissenting)

subsequently issued 2005 Guidelines provide a good explanation of the current state of affairs.

B. Ex parte Lundgren and the Interim Examination Guidelines

Although it initially came as a surprise to many,¹²³ the opinion of the BPAI in *Ex parte Lundgren* now represents one of the clearest stands by the Patent Office against the subject-matter eligibility of software-related inventions. Interestingly, it is the extensive and thorough, albeit misguided, dissent in *Lundgren* that is truly representative of the current Patent Office position.¹²⁴ Dr. Carl A. Lundgren submitted a patent application directed towards a method of compensating a manager and having a stated purpose of preventing collusion by “reducing incentives for industry collusion between the primary firm and a set of comparison firms in said industry” and by “reducing incentives for coordinated special interest industry lobbying.”¹²⁵ The examiner rejected all of the claims in Lundgren’s application for ineligible or nonstatutory subject matter under 35 U.S.C. § 101.¹²⁶ The examiner found that the claimed process produced a useful, concrete, and tangible result, as required by the Federal Circuit’s *State Street* decision; however, the examiner maintained that the invention was ineligible subject matter because it was “outside the technological arts” and was not a practical application.¹²⁷ A panel of the BPAI initially reversed the examiner’s rejections.¹²⁸ The examiner sought reconsideration, and an expanded panel of the BPAI reheard the case, leading to the instant opinion.¹²⁹

(discussed *infra* note 152); *eBay Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1837, 1842 (2006) (Kennedy, J., concurring). The Federal Circuit has also signaled a reining in of its previously expansive reading of § 101 as applied to software and business methods in *In re Comiskey*, 499 F.3d 1365 (Fed. Cir. 2007), as well as a general willingness to revisit statutory subject matter in *In re Nuijten*, 500 F.3d 1346 (Fed. Cir. 2007). See *infra* notes 152–53 and accompanying text.

122. B.P.A.I. No. 2003-2088, 76 U.S.P.Q.2d 1385 (Sept. 28, 2005).

123. See Harold C. Wegner, *Recent Software Protection Trends* 6, 7 (Nov. 9, 2005), http://www.foley.com/files/tbl_s31Publications/FileUpload137/2991/doc.pdf.

124. See, e.g., *Ex parte Bilski*, B.P.A.I. No. 2002-2257, 2006 Pat. App. LEXIS 51 (Sept. 26, 2006) (adopting the analysis of the *Lundgren* dissent and rejecting the invention for lack of statutory subject matter).

125. *Ex parte Lundgren*, 76 U.S.P.Q.2d at 1385 (quoting application of Lundgren, 08/093,516).

126. *Id.* at 1386.

127. *Id.*

128. *Id.*

129. *Id.*

The BPAI reversed the examiner's rejection under § 101 in a very short, concise, and sound opinion.¹³⁰ The Board found that the only issue in the case was whether the claims were "limited to the technological arts, as required by 35 U.S.C. § 101."¹³¹ After reviewing the precedent alleged to have given rise to the "technological arts" test,¹³² the *Lundgren* majority held that "[t]here is currently no judicially recognized separate 'technological arts' test to determine patent eligible subject matter under § 101."¹³³ Thus, because the Examiner had already determined that the invention produced a useful, concrete, and tangible result, the invention was eligible for patent protection.

The majority opinion in *Lundgren* is overshadowed by the extensive partial dissent by Judge Barrett.¹³⁴ This dissent, although only of persuasive precedential value, is the analysis that is clearly shaping the future of the Patent Office's position on the patent eligibility of software-related inventions. This influence is evidenced in the 2005 Guidelines, discussed below,¹³⁵ and in subsequent decisions of the BPAI.¹³⁶ Although Judge Barrett joined the majority in rejecting the "technological arts" test employed by the examiner,¹³⁷ Judge Barrett disagreed with the majority's assertion that any series of steps is a "process" under § 101 and that the requirement that the invention produce a useful, concrete, and tangible result is sufficient to determine eligibility.¹³⁸ After providing a very thorough, thoughtful, and detailed analysis of the history of eligible subject-matter jurisprudence (provided in abbreviated form above), Judge Barrett

130. See generally *id.* at 1385–88.

131. *Id.* at 1387.

132. Specifically, the examiner cited *In re Musgrave*, 431 F.2d 882 (C.C.P.A. 1970), *In re Toma*, 575 F.2d 872 (C.C.P.A. 1978), and *Ex parte Bowman*, B.P.A.I. No. 1999-0583, 61 U.S.P.Q.2d 1669 (June 12, 2001), as supporting the existence of such a test. *Ex parte Lundgren*, 76 U.S.P.Q.2d at 1387.

133. *Ex parte Lundgren*, 76 U.S.P.Q.2d at 1388. The Board held that, to whatever extent *Musgrave* may have implied the existence of a "technological arts" requirement, *Toma* specifically held that *Musgrave* "was not intended to form a basis for a new § 101 rejection." *Id.* at 1387 (quoting *In re Toma*, 575 F.2d at 878). With respect to *Bowman*, the Board quickly dismissed the case as nonprecedential and nonbinding. *Id.*

134. See *id.* at 1389–1432; see also *infra* Part IV.C.3.c.

135. See *infra* notes 143–47 and accompanying text.

136. See, e.g., *Ex parte Bilski*, B.P.A.I. No. 2002-2257, slip op. at 42–53, 2006 Pat. App. LEXIS 51, *52–64 (Sept. 26, 2006) (adopting the *Lundgren* opinion in whole, but relying primarily on the analysis in Judge Barrett's dissent).

137. *Ex parte Lundgren*, 76 U.S.P.Q.2d at 1389. In fact, the majority opinion does not even reject Judge Barrett's thoughts outright, stating instead that Judge Barrett's new ground of rejection "would involve development of the factual record and, thus, [the Court] take[s] no position in regard to the proposed new ground of rejection." *Id.* at 1388.

138. See *id.* at 1389–90.

stated that precedent suggests three potential independent tests for statutory subject matter.¹³⁹ These tests include 1) whether the invention includes a physical transformation, 2) whether the invention falls within a set of exceptions to statutory subject matter, for laws of nature, natural phenomena, and abstract ideas, and 3) whether the invention produces a useful, concrete, and tangible result.¹⁴⁰ The common theme underlying each of these three tests is the notion of physicality or tangibility, a theme that carries over into the 2005 Guidelines.

In applying each of these three tests—transformation, exceptions, and useful, concrete and tangible result—to Dr. Lundgren’s invention, Judge Barrett would have affirmed the examiner’s rejection of the claims under § 101 for lack of statutory subject matter.¹⁴¹ Specifically, he found that Dr. Lundgren’s process performed no physical transformation and included no physical implementation or structure, that the process was a disembodied abstract idea, and that the process did not provide a concrete and tangible result because it lacked physical instantiation.¹⁴²

In October 2005, the Patent Office issued Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility to again provide guidance for examiners.¹⁴³ The guidelines were issued ostensibly because the Patent Office had “seen increasing numbers of applications . . . that raise subject matter eligibility issues.”¹⁴⁴ Not unlike the 1996 Guidelines for software examination described above, the 2005 Guidelines start innocently with a general process for examination that could be applied to any application. The examiner is directed to determine what the applicant invented, conduct a thorough search of the prior art, determine whether the claimed invention complies with the subject-matter eligibility requirement of § 101, evaluate the application for compliance with the other requirements for patentability (i.e., §§ 102, 103, and 112), and clearly communicate the findings, conclusions, and bases to the applicant.¹⁴⁵ In relevant point, the 2005 Guidelines reject the “technological arts” test, along with other tests that have been discredited.¹⁴⁶ Instead, the

139. *See id.* at 1429–32. Judge Barrett also acknowledges that precedent perhaps supports a “technological arts” test, but for the reasons elucidated earlier in his opinion, he concludes that this is not a separate test. *Id.* at 1430.

140. *Id.* at 1429–32.

141. *See id.* at 1431–32.

142. *Id.* at 1430–31.

143. 2005 Guidelines, *supra* note 19. It is worthy of notice that the guidelines are not the result of notice-and-comment rulemaking and thus do not have the effect of law. *Id.* at 2.

144. *Id.* at 1.

145. *Id.* at 3–29.

146. *Id.* at 42–49.

guidelines throughout subtly emphasize an element of physicality to find patent eligibility. In particular, “[t]he guidelines explain that a practical application of a 35 U.S.C. § 101 judicial exception is claimed if the claimed invention *physically* transforms an article or physical object to a different state or thing, or if the claimed invention otherwise produces a useful, concrete, and tangible result.”¹⁴⁷

The comment period on the 2005 Guidelines was extended through July 2006, in anticipation of the Supreme Court’s decision in *Laboratory Corp. of America Holdings v. Metabolite Laboratories, Inc.* (“*LabCorp*”), to be issued by the end of the Court’s October 2005 term.¹⁴⁸ Although not at issue in the proceedings below, the Supreme Court’s interest in *LabCorp* was limited to clarifying patent-eligible subject matter.¹⁴⁹ The claim at issue involved essentially two steps: assaying a body fluid and correlating the results of the assay with a standard to diagnose mineral deficiency.¹⁵⁰ This claim looks very similar to the software-related claims that the Supreme Court reviewed in the 1970s, such as *Parker v. Flook*, where the claims at issue boiled down to two steps: assess the condition of the system and recalculate the alarm limits based on the condition.¹⁵¹ Depending on how the Supreme Court may have ruled in *LabCorp*, the entire software-related patent world may have been turned upside down. In the end, the Supreme Court dismissed the case as improvidently granted in June 2006, over dissent.¹⁵² Although the patent bar, especially those practicing in the software-related arts, may have breathed a sigh of relief with the Supreme Court’s dismissal, the reprieve appears to be short lived. In September

147. *Id.* at 2 (emphasis added).

148. John Doll, Request for Comments on Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, July 11, 2006, <http://www.uspto.gov/web/offices/com/sol/og/2006/week28/patguide.htm>.

149. *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 126 S. Ct. 2921, 2925 (2006) (Breyer, J., dissenting).

150. *Id.* at 2924.

151. *Id.*; see *Parker v. Flook*, 437 U.S. 584, 585 (1978).

152. *Lab. Corp.*, 126 S. Ct. at 2921. The dissent would have found the patent involved to be directed to a natural phenomenon and thus invalid due to lack of statutory subject matter. *Id.* at 2927 (Breyer, J., dissenting) (“There can be little doubt that the correlation between homocysteine and vitamin deficiency set forth in claim 13 is a ‘natural phenomenon.’”). The dissent also took aim at the invention as a process. *Id.* at 2928 (Breyer, J., dissenting) (“[The patentee] cannot avoid the fact that the process is no more than an instruction to read some numbers in light of medical knowledge.”). Finally, the dissent took aim at the Federal Circuit’s business method jurisprudence, noting that the Supreme Court never made the statement that a process is patentable so long as it produces a “useful, concrete, and tangible result,” and pointing to Supreme Court cases such as *Parker v. Flook*, 437 U.S. 584, and *Gottschalk v. Benson*, 409 U.S. 63 (1972), that arguably would be patentable under the Federal Circuit’s lax standard. *Lab. Corp.*, 126 S. Ct. at 2927–28 (Breyer, J., dissenting).

2007, the Federal Circuit issued the *In re Nuijten* and *In re Comiskey* opinions, each of which provide prime opportunity for the Supreme Court to take up the issue of statutory subject matter. In any event, it is clear that this area of law remains unsettled, and the Supreme Court seems poised to enter into the discussion.¹⁵³

III. WHY THE QUESTION OF SUBJECT-MATTER ELIGIBILITY IS AN ANT (TINY AND INCONSEQUENTIAL)

Satisfying the requirement of § 101 is merely a threshold requirement to obtaining a patent.¹⁵⁴ As such, this threshold should be a realistic hurdle, not an insurmountable test. The language of § 101 is broad and inclusive; the plain meaning of § 101 is that if an invention falls into any one of the four enumerated categories, the applicant “is allowed to pass through to the second door,” the remaining patentability requirements of §§ 102, 103, and 112.¹⁵⁵ Because nearly all inventions can be aptly categorized as a process, machine, manufacture, or composition of matter, the first door should not present much of a challenge. Can it really be so easy?¹⁵⁶

Any analysis of law has to begin with the language and its purpose. With respect to determining what subject matter is eligible for patenting, the language comes from two sources—the Constitution and the Patent Act. The Constitution authorizes the grant of a patent for an invention that promotes the progress of the useful arts.¹⁵⁷ The language of the Patent Act is equally broad, although in a different way. Each of the provisions that must be satisfied prior to obtaining a patent, namely §§ 101, 102, 103, and 112, serves a purpose in ensuring that the patent reward is granted to further the

153. The unsettled nature of this subject is bolstered by the urgings of the Patent Office to the Federal Circuit to decide the *In re Comiskey* case on statutory subject matter grounds, an issue that was raised *sua sponte* by the Federal Circuit at oral argument on another issue. *In re Comiskey*, 499 F.3d 1365, 1371 (Fed. Cir. 2007) (quoting the Patent Office’s supplemental briefing in response to the court’s raising of the issue as urging resolution to “give the [Patent] Office needed guidance in this area”).

154. *See id.* at 1371 (citing *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1372 n.2 (Fed. Cir. 1998)) (noting that § 101 is a threshold issue that must be addressed before other questions of patentability); *In re Bergy*, 596 F.2d 952, 960 (C.C.P.A. 1979) (“The first door which must be opened on the difficult path to patentability is § 101 . . .”).

155. *In re Bergy*, 596 F.2d at 960.

156. To be fair, there are a number of thoughtful articles on this topic that do not find the answer to come so easily. *See, e.g.*, Chiappetta, *supra* note 104; Kreiss, *supra* note 102; John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139 (1999). I acknowledge the debate, but take the position that it can be this easy because the hard questions are more appropriately addressed under other statutory patentability requirements.

157. U.S. CONST. art. I, § 8, cl. 8.

constitutional mandate of promoting the useful arts as described above.¹⁵⁸ In brief, the eligible subject-matter requirement of § 101 determines whether the invention is related to the useful arts.¹⁵⁹ The utility requirement of § 101, and the novelty and nonobvious requirements of § 102 and § 103, respectively, ensure the invention is a step forward or progress.¹⁶⁰ Finally, description requirements of § 112 ensure that a person having ordinary skill in the art can identify, understand, and practice the invention, ensuring that progress is being promoted.¹⁶¹

To ensure that the invention falls within the “useful arts,” § 101 of the Patent Act permits a patent to be granted to anyone who “invents or discovers any new and useful process, machine, manufacture, or composition of matter.”¹⁶² Statutory interpretation must begin with the language of the statute, and words are given their ordinary and common meanings, absent an alternative definition.¹⁶³ Further, “in dealing with the patent laws, we have more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed.”¹⁶⁴ Giving the plain language of the statute its ordinary and common meaning, it is clear that these four broad categories can arguably be construed to cover nearly everything, which was Congress’ intent.¹⁶⁵ As the Supreme Court noted in *Diamond v. Chakrabarty*, “[i]n choosing such expansive terms, . . . modified by the comprehensive ‘any,’ Congress plainly contemplated that the patent laws would be given wide scope.”¹⁶⁶ The legislative history supports this breadth, noting that § 101 encompasses “anything under the sun that is made by man.”¹⁶⁷

Putting aside all judicial precedent related to patent eligibility of software-related inventions and viewing the question solely in light of the Patent Act provisions, it is confusing that so many would take the position that software is not patentable. Even limiting the notion of “useful arts” to its historic definition of manufactures and industrial processes, it seems

158. See Chiappetta, *supra* note 104, at 100–02.

159. *Id.* at 102.

160. *Id.* at 100.

161. *Id.* at 100–01.

162. 35 U.S.C. § 101 (2000).

163. *Diamond v. Diehr*, 450 U.S. 175, 182 (1981) (citing *Perrin v. United States*, 444 U.S. 37, 42 (1979)).

164. *Id.* (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980)).

165. See *id.* at 183. There are anecdotes of professors who, when teaching subject matter eligibility, tell students that if an attorney cannot make a persuasive argument that an invention falls within one of the four statutory categories, the inventing client should seek a new, competent attorney.

166. *Chakrabarty*, 447 U.S. at 308.

167. S. REP. NO. 1979, at 5 (1952); H.R. REP. NO. 1923, at 6–7 (1952).

fairly clear that computer-related inventions are within the useful arts.¹⁶⁸ Business, manufacture, and service industries all consider software-related inventions to be critical. Although the Framers may never have contemplated the Internet, or even a computer, software-related inventions would seem to be precisely the type of progress and business activity that warrants the protection of the patent system.¹⁶⁹

The courts have recognized this shift and have struggled to adapt. The Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*, noted:

Since the process of manipulation of numbers is a fundamental part of computer technology, we have had to reexamine the rules that govern the patentability of such technology. The sea-changes in both law and technology stand as a testament to the ability of law to adapt to new and innovative concepts, while remaining true to basic principles. . . . [T]his court . . . has struggled to make our understanding of the scope of § 101 responsive to the needs of the modern world.¹⁷⁰

A software-related invention will nearly always be a process, because computer programs are literally a set of instructions that directs a computer to perform a certain function.¹⁷¹ Thus, unless the invention, if patented, would preempt a law of nature, natural phenomenon, or abstract idea, and so long as it has a practical application, it will always be statutory subject matter. As a basic threshold issue, the Patent Office's raising of the bar for patent eligibility of software-related inventions is really making a mountain out of an anthill, or ant, as it were, and adding an inquiry to these inventions that is not present for other technological areas. Given the Supreme Court's

168. International patent systems, however, have struggled with the same issue and found software and business method inventions to be unpatentable, although there have been initiatives to permit software patents in the European Patent system. See, e.g., Timothy R. Holbrook, *The Treaty Power and the Patent Clause: Are There Limits on the United States' Ability to Harmonize?*, 22 CARDOZO ARTS & ENT. L.J. 1, 9–10 (2004).

169. See Kreiss, *supra* note 102, at 64–66 (making a similar argument).

170. *AT&T Corp. v. Excel Commc'ns, Inc.*, 172 F.3d 1352, 1356 (Fed. Cir. 1999); see also *In re Nuijten*, 500 F.3d 1346, 1358 (Fed. Cir. 2007) (Linn, J., concurring in part and dissenting in part) (“[W]e must reconcile cutting-edge technologies with a statute, the language of which dates back to the beginning of the Republic.”). This notion also has the power to work in reverse, that judicial decisions will influence law. See Pauline Newman, *The Federal Circuit in Perspective*, 54 AM. U. L. REV. 821, 825–26 (2005) (“[E]xperience shows the power of judicial decisions to affect technologic advance and commercial vigor, particularly as new technologies have arisen.”).

171. Compare *In re Nuijten*, 500 F.3d at 1354–55 (defining a process under 35 U.S.C. § 101 as an act or series of acts that produce a given result), with *In re Comiskey*, 499 F.3d 1365, 1378 (Fed. Cir. 2007) (seemingly drawing a distinction between a method—a set of steps for doing something—and a process).

renewed interest in this seemingly settled topic, it appears clear that it too is likely to overcomplicate the inquiry.

IV. WHY THE INTERIM GUIDELINES ARE LIKE AN ELEPHANT GUN (OVERKILL, ANYONE?)

Because the Patent Office unnecessarily views the question of subject-matter eligibility as more complex than simply whether the invention falls within one of the four enumerated categories, it is unsurprising that the 2005 Guidelines, promulgated by the Patent Office to deal with the increasing number of applications that invoke statutory subject-matter questions, also obfuscate the true inquiry. There are essentially two inquiries that must be made to determine if an invention comprises eligible subject matter for patenting: first, does the invention fit within at least one of the statutorily defined categories of § 101, and second, does the invention fall within one of the three exceptions, namely law of nature, natural phenomenon, or abstract idea. The guidelines, however, add multiple and unnecessary layers and raise the basic threshold inherent in this simple approach—that is, the Patent Office is aiming at the simple issue of eligible subject matter with an unwieldy elephant gun.

The Patent Office's approach to this problem is overkill for two reasons. First, there is clearly some hostility toward the protection of software-related inventions at the Patent Office and beyond. Despite the wide berth generally given to patent-eligible subject matter in every other technological arena, the examining corps of the Patent Office continues to find new, and at times ingenious, ways to reject this type of application.¹⁷² And there is clearly some foothold of support for this notion at higher levels of the Patent Office, up to and including the BPAI.¹⁷³ While the 2005 Guidelines superficially disabuse the perception of software-related inventions as ineligible subject matter, the reality is that the guidelines actually provide more bases for § 101 rejections going forward. This sleight of hand makes it appear that the Patent Office is accepting the *Lundgren* majority, but the reality is that it is the dissent that has become policy.

Second, and more troubling, many applications suffer § 101 rejections as a proxy for other, more difficult rejections and policy considerations.

172. Consider, for example, the examiner in *Ex Parte Lundgren*, B.P.A.I. No. 2003-2088, 76 U.S.P.Q.2d 1385 (Sept. 28, 2005) (applying the technological arts requirement), discussed *supra* Part II.B.

173. See, e.g., *Ex Parte Bilski*, B.P.A.I. No. 2002-2257, slip op. at 42–65, 2006 Pat. App. LEXIS 51, *52–80 (Sept. 26, 2006) (adopting the *Lundgren* dissent's more stringent requirements for patent eligibility for software-related inventions).

Because § 101 presents a threshold issue to be determined early in the examination process, by availing itself of this provision the Patent Office can avoid the often-problematic examination of software-related inventions. This impression is supported by the courts' own opinions explaining § 101 rejections. Even the courts often resort to the difficulty of examining these applications for the remaining patentability requirements as justification for these rejections. A similar argument can be made for policy considerations: the justification for § 101's widespread use in rejections is often that software patents are "bad" for society, not that the applications do not fit within the statutorily defined categories. After providing a comprehensive review of the 2005 Guidelines, I discuss the hostility and proxy arguments in greater detail.

A. 2005 Guidelines

As discussed above, the general provisions of the 2005 Guidelines are reasonable enough. First, the examiner must determine what the applicant invented.¹⁷⁴ The guidelines instruct the examiner to ascertain this by: 1) identifying and understanding any utility or practical application asserted for the invention, 2) carefully reading the written description, and 3) reviewing the claims.¹⁷⁵ The examiner then conducts a thorough search of the prior art and determines whether the claimed invention complies with the subject-matter eligibility requirement of § 101.¹⁷⁶ For determining whether the invention complies with § 101, the guidelines provide four steps. First, the examiner must consider the breadth of 35 U.S.C. § 101 under controlling law.¹⁷⁷ Second, the examiner must determine whether the

174. 2005 Guidelines, *supra* note 19, at 3.

175. *Id.* at 3–10. The first step, identifying utility and practical application, is actually an imposition of the § 101 utility requirement, *see, e.g., In re Fisher*, 421 F.3d 1365 (Fed. Cir. 2005), which arguably renders the § 101 subject matter eligibility question no longer a threshold. For the purposes of this article and because it is so noted by court opinions, *see, e.g., In re Bergy*, 596 F.2d 952, 960 (C.C.P.A. 1979), I will continue to view subject matter eligibility as the threshold issue for patenting.

176. 2005 Guidelines, *supra* note 19, at 10–11. As a side note, it is unclear to me (and the 2005 Guidelines do not explain) why the examiner would need to conduct a thorough search of the prior art before determining subject matter eligibility under § 101. *In re Bergy*, 596 F.2d at 962–63 ("Prior art is irrelevant to the determination of statutory subject matter under § 101.") (emphasis omitted); *cf. SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1360 (Fed. Cir. 2005) (noting that even the scope of the claims is irrelevant to the subject matter eligibility analysis, because "[e]ither the subject matter falls within Section 101 or it does not") (quoting *Animal Legal Def. Fund v. Quigg*, 932 F.2d 920, 930 (Fed. Cir. 1991)).

177. 2005 Guidelines, *supra* note 19, at 11–14 ("In choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress

claimed invention falls within the listed statutory categories (process, machine, manufacture, or composition of matter).¹⁷⁸ Third, the examiner must determine whether the claimed invention falls within a judicially created exception to the § 101 enumerated categories; that is, whether the invention is a law of nature, natural phenomena, or abstract idea.¹⁷⁹ However, “[w]hile abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be.”¹⁸⁰ Fourth, if the requirements for subject-matter eligibility are not met, the examiner must establish a *prima facie* case on the record.¹⁸¹ Otherwise, after the examiner is satisfied with an invention’s subject-matter eligibility, he proceeds to evaluate the application’s sufficiency under §§ 102, 103, and 112.¹⁸²

To assist the examiner in determining whether the claimed invention is a law of nature, natural phenomena, or abstract idea, the Patent Office directs the examiner to determine if the claim is directed to a practical application of a judicial exception.¹⁸³ A practical application can be identified if “the claimed invention physically *transforms* an article or physical object to a different state or thing, or if the claimed invention otherwise produces a useful, concrete, and tangible result,” based on certain factors.¹⁸⁴ These tests are clearly artifacts remaining from the courts’ journey to arrive at the patent eligibility of software-related inventions, as laid out by the discussion above and as seen in Judge Barrett’s disquisition in *Lundgren*.¹⁸⁵

In applying these tests, the 2005 Guidelines state that the examiner should first determine if the claim “provides a transformation or reduction of an article to a different state or thing.”¹⁸⁶ If such a transformation is present, the inquiry is complete and the claim meets the requirements of

plainly contemplated that the patent laws would be given wide scope.” (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 308–09 (1980))).

178. *Id.* at 14–16. This inquiry is nearly *pro forma*. “In many instances, it is clear within which of the enumerated categories a claimed invention falls. Even if the characterization of the claimed invention is not clear, this is usually not an issue that will preclude making an accurate and correct assessment with respect to the section 101 analysis.” *Id.* at 15.

179. *Id.* at 16–18.

180. *Id.* at 17. This may be a difficult determination; a large portion of the remainder of the 2005 Guidelines is directed to making this assessment.

181. *Id.* at 24.

182. *Id.* at 25–28.

183. *See id.* at 1–2.

184. *Id.* at 2 (emphasis added).

185. *Ex Parte Lundgren*, B.P.A.I. No. 2003-2088, 76 U.S.P.Q.2d 1385, 1389 (Sept. 28, 2005) (Barrett, J., dissenting).

186. 2005 Guidelines, *supra* note 19, at 19.

§ 101.¹⁸⁷ If not, the examiner must proceed to the second question: does the claim “provide[] a practical application that produces a useful, tangible and concrete result.”¹⁸⁸ The guidelines then go on to define each of these terms.

In particular, an invention will be found to be “useful” if it satisfies the utility requirement of § 101.¹⁸⁹ This will require that the utility of the invention be specific, substantial, and credible.¹⁹⁰ The invention is “tangible” if it produces a real-world result.¹⁹¹ Finally, the invention will produce a “concrete” result if the process is repeatable or predictable, or produces substantially the same result again.¹⁹²

The examiner must also ensure that the invention, were it to be patented, would not preempt the use of a law of nature, natural phenomena, or abstract idea. “One may not patent a process that comprises every ‘substantial practical application’ of an abstract idea, because such a patent ‘in practical effect would be a patent on the [abstract idea] itself.’”¹⁹³ “If an examiner determines that the claimed invention preempts a § 101 judicial exception, the examiner must identify the abstraction, law of nature, or natural phenomenon and explain why the claim covers every substantial practical application thereof.”¹⁹⁴ Otherwise, if the invention would not preempt a judicial exception, § 101 is satisfied, and the examiner can proceed to examine the application for the other patentability standards.¹⁹⁵ The guidelines conclude with a set of annexes.¹⁹⁶

187. *Id.*

188. *Id.* at 19–20 (emphasis omitted). The guidelines make clear that it is not the steps that need to be useful, tangible, and concrete but rather the result. *Id.* at 20–22.

189. *Id.*

190. *Id.*

191. *Id.* at 21–22.

192. *Id.* at 22. The guidelines also state that a rejection for failure to produce a concrete result should also result in a rejection under 35 U.S.C. § 112 for lack of enablement because the invention cannot operate as intended without undue experimentation. *Id.*; see 35 U.S.C. § 112(1) (2000).

193. 2005 Guidelines, *supra* note 19, at 23 (quoting *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972)).

194. *Id.*

195. *Id.* at 24–28.

196. *Id.* at 30–59. Annex I provides a flowchart that visually depicts the previously described examination procedure. *Id.* at 30–31. Annex II reviews case law relevant to the determination of eligible and ineligible subject matter. *Id.* at 32–41. Annex III lists previously applied tests for subject-matter eligibility of software that have since been renounced by the courts and the Patent Office, including the technological arts test, the Freeman-Walter-Abele test, the mental steps test, the machine-implemented test, and the per se data transformation test. *Id.* at 42–49. Annex IV discusses computer-related nonstatutory subject matter, imparting the “functional descriptive material” or “nonfunctional descriptive material” categories. *Id.* at 50–57. Finally, Annex V adds specific information about mathematical algorithms. *Id.* at 58–59.

The 2005 Guidelines may seem comprehensive; however, they actually represent a bit of heavy-handedness on the part of the Patent Office. Specifically, the guidelines single out software-related inventions for special treatment where none is required and, in doing so, add a number of unnecessary steps to the § 101 determination—each step increasing the chance that the Patent Office will find grounds to reject the application at an early, threshold stage of examination. This overkill may be attributed to two related reasons: hostility towards software-related inventions and the use of the § 101 subject-matter inquiries as a simple proxy for other questions more appropriately answered elsewhere.

B. Hostility to Software-Related Inventions

One explanation for the overkill nature of the 2005 Guidelines is that the Patent Office is hostile toward software-related inventions. Without question, and clearly evidenced by the case-law story told above,¹⁹⁷ the Patent Office has historically been opposed to software-related applications.¹⁹⁸ Despite the popular belief that this hostility toward software was abating, the *Ex parte Lundgren* opinion, the cases that follow, and the 2005 Guidelines show that the resistance is still present. Moreover, it seems that this opposition is also supported by at least some Justices on the Supreme Court, as well as some judges on the Federal Circuit.

There is no consensus regarding the origin of the Patent Office's opposition to the protection of software-related inventions. The Patent Office could be displaying a remnant of the same hostility that the courts held for many years.¹⁹⁹ However, it may also be argued that the Patent Office is merely following this hostile line of cases in its guidelines and is unable of itself to make any changes over the existing precedent. Even with the most generous of interpretations, however, the Patent Office has made its own poor choices in implementing the case law.

197. See *supra* Part II.

198. See Jeffrey R. Kuester, Scott A. Horstemeyer, & Daniel J. Santos, *A New Frontier in Patents: Patent Claims to Propagated Signals*, 17 J. MARSHALL J. COMPUTER & INFO. L. 75, 76 ("At the time the Board heard the appeal [in *In re Beauregard*], the [Patent Office] was hostile in allowing any type of patent protection for software, despite clear legal precedent to the contrary . . ."); *Symposium on Bioinformatics and Intellectual Property Law*, 8 B.U. J. SCI. & TECH. L. 254, 270 (2002) ("One of the core issues in both [biotechnology and software] is the hostility toward intellectual property. . . . We have . . . had advocates arguing against business method and software patents.").

199. See, e.g., A. Samuel Oddi, *An Uneasier Case for Copyright than for Patent Protection of Computer Programs*, 72 NEB. L. REV. 351, 407 (1993) ("In the early 1980's the [Supreme] Court's bias against patents in general, which had persisted over the prior half century, began to erode.").

Alternatively, the opposition may be in response to the systemic criticisms about the Patent Office's inability to adequately examine patent applications and the resulting lack of quality in issued patents.²⁰⁰ Software patents in particular seem to be the target of much of these complaints.²⁰¹ Common objections include that granted software patents are overly broad, that the claims for software-related inventions are often poorly drafted and ambiguous, and that the inventions at issue are obvious.²⁰² While these problems plague the Patent Office universally, the concerns may be exacerbated by the lack of sufficient prior art in the software-related arts. Rather than working to ensure that higher-quality software patents are issued, the Patent Office might be hoping to avoid the problem altogether by simply rejecting these applications at the threshold level of subject-matter eligibility. "These pragmatic institutional concerns have been one motivation for the [Patent Office's] long standing position that computer software was not patentable subject matter."²⁰³ Perhaps in attempting to avoid criticism for issuing unwarranted patents, the Patent Office may have run headlong into a separate problem, where subject-matter rejections are being proffered not only to avoid issuing bad patents in the main, but also specifically to serve as proxies for other patentability requirements or policy-based inquiries.

C. Subject-Matter Rejections as Proxies

Rather than reacting directly to the criticism of its performance in granting software patents, the Patent Office may be using § 101 rejections as proxies for other difficult questions of patentability and policy. In fact,

200. See, e.g., Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 606 (1999) ("A recurring theme in the assessment of PTO performance is poor examination quality. . . ."); James Gleick, *Patently Absurd*, N.Y. TIMES MAG., Mar. 12, 2000, at 47 (noting that "the patent office has neither the time nor the expertise . . . to distinguish good patents from bad").

201. See, e.g., Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1495 (2001) ("The [Patent Office] has come under attack of late for failing to do a serious job of examining patents, thus allowing bad patents to slip through the system. The criticism is particularly strong in specific industries, notably software and Internet 'business method' patents, in which the [Patent Office] has arguably failed to respond quickly enough to changing legal circumstances." (footnotes omitted)).

202. See Wegner, *supra* note 123, at 10 (citing IBM patent leader David J. Kappos as noting, *inter alia*, that "[t]he Federal Circuit has essentially excused software inventions from compliance with the enablement and best mode requirements, but in a manner that raises serious questions about how stringently it will read the nonobviousness requirements").

203. Chiappetta, *supra* note 104, at 101.

the problem may go deeper. If we accept the argument that many of these proxy-type rejections are anchored in case law precedent, then perhaps the courts too are using these rejections to avoid the hard analyses required by the other statutory provisions. To be sure, it is tempting to try to improve the ease of administration and enforcement of Patent Office activity, especially in view of the complaints raised by the legal community and the public at large about improvidently granted software-related patents. Because it has been argued that there is a dearth of prior art in the software field, the rejection of patent applications under § 101 is particularly attractive. This type of rejection is not based on prior art, and, because patentable subject matter is a threshold issue, it allows the application to be disposed of at an early stage.²⁰⁴ However, “the primary objectives of the patent laws are not achieved merely by ensuring ease and speed of prosecution, predictability of results or maximizing enforcement options.”²⁰⁵ Rather, the goal of the subject-matter inquiry should be “to determine which inventive activities, if any, should be targeted by the patent incentive.”²⁰⁶ Although the proxy-type inquiries may be related to statutory subject matter, they raise separate issues and should be determined separately.

As one such example of a proxy-type inquiry, the analysis of novelty (§ 102) and nonobviousness (§ 103) has become entangled with the eligible subject-matter analysis under § 101, leading to a confusion of both discussions.²⁰⁷ One example of this confusion is the Supreme Court’s opinion in *Parker v. Flook*. As the dissent, which recognizes the conflation in the majority opinion, characterized the case:

The issue here is whether the claimed process loses its status of subject-matter patentability simply because *one step* in the process would not be patentable subject matter if considered in isolation. . . . I suppose that thousands of processes and combinations have been patented that contained one or more steps or elements that themselves would have been unpatentable subject matter. . . . [I]t strikes what seems to me [a] damaging blow at basic principles of patent law by importing into its inquiry under 35 U.S.C. § 101 the criteria of novelty and inventiveness.²⁰⁸

204. See *In re Comiskey*, 499 F.3d 1365, 1373 n.7 (Fed. Cir. 2007) (“The § 101 issue is an antecedent question to the [other requirements for patentability].”).

205. Chiappetta, *supra* note 104, at 127.

206. *Id.* at 128.

207. See, e.g., Sam S. Han, *Analyzing the Patentability of “Intangible” Yet “Physical” Subject Matter*, 3 COLUM. SCI. & TECH. L. REV. 2 (2002).

208. *Parker v. Flook*, 437 U.S. 584, 599–600 (1978) (Stewart, J., dissenting).

The problem is that the points of each of these tests are different. While the statutory subject-matter test ensures that we are inducing inventive activity to promote the “useful arts,” the novelty and nonobvious questions seek to ensure that what is promoted is progress.²⁰⁹

Although *Parker v. Flook* may be an early opinion, this entanglement of the statutory subject-matter inquiry with the other patentability requirements remains just as current today. For example, the *In re Comiskey* opinion links eligible subject matter with the requirement that there be a specified machine for performing the process, an inquiry that would more appropriately be made under the written description requirement of 35 U.S.C. § 112.²¹⁰ Similarly, *In re Nuijten* raises a number of proxy-type arguments. In addressing a tangential issue, the court states that the focus of the statutory subject-matter inquiry should not be on which of the four categories (process, machine, manufacture, or composition of matter) to which a claim is directed, but rather on the claimed invention’s practical utility, a separate issue.²¹¹ In the dissenting opinion in *Nuijten*, the statutory subject-matter inquiry is, at turns, ensnared with § 101 utility and § 102 novelty.²¹² The use of statutory subject matter as a proxy for other inquiries is clearly a persistent problem that is not abating.

Other commentators have also noted this proxy-type use of subject-matter eligibility when a more appropriate inquiry would be found in another provision for patentability. John Squires and Thomas Biemer note that the Patent Office’s approach of using § 101 to ensure quality patents is the improper focus: “[O]nce the focus is properly placed on the quality of the patents it issues in [the financial service industry], it becomes clear that different tools, 35 U.S.C. §§ 102 and 103, readily exist for the [Patent Office] to ensure such quality.”²¹³

209. *Id.* at 595.

210. *In re Comiskey*, 499 F.3d 1365, 1379–80 (Fed. Cir. 2007). This proxy argument is explored in more detail under the “mental steps” rejection analysis, *infra* Part IV.C.3.b.

211. *See In re Nuijten*, 500 F.3d 1346, 1353–54 (Fed. Cir. 2007). For further detail, see *infra* Part IV.C.1 and accompanying text discussing the distinction between practical utility and subject-matter eligibility.

212. *See In re Nuijten*, 500 F.3d at 1363 (Linn, J., concurring in part and dissenting in part) (“[T]he terms ‘new’ and ‘useful’ define and delimit the exceptions from statutory subject matter.”). Despite the use of proxy-type arguments in his own analysis, Judge Linn is at least conscious of the entanglements. *See id.* at 1363, 1366 (noting that novelty is generally a requirement of § 102, not § 101, and further admonishing the Patent Office for blurring the line between § 101 eligible subject matter and § 103 obviousness).

213. John A. Squires & Thomas S. Biemer, *Patent Law 101: Does a Grudging Lundgren Panel Decision Mean that the USPTO Is Finally Getting the Statutory Subject Matter Question Right?*, 46 INTELL. PROP. L. REV. 561, 581–82 (2006). Although Squires and Biemer are largely concerned with the financial services industry, the truth of their statement relates to software-related inventions in any sector.

The desire to alleviate other examination and invalidity problems by resorting to § 101 is not unique to the Patent Office.²¹⁴ For example, in the biopharmaceutical case *SmithKline Beecham Corp. v. Apotex Corp.*, the concurring opinion raised § 101 concerns, arguing that the composition of matter at issue could be “reproduced by nature unaided by man.”²¹⁵ The majority, on the other hand, accused the concurrence of “confus[ing] patent eligibility under § 101 with patentability under other provisions in the Patent Act, such as 35 U.S.C. § 102.”²¹⁶ Instead, the majority states that the claimed invention is a composition of matter or article of manufacture, squarely within § 101, and the inquiry should so end there.²¹⁷

This proxy-type rejection can also be seen both in tests that have been excised from the subject-matter calculus by the 2005 Guidelines (such as the mental steps test or the machine implementation test), as well as those which remain (such as the transformation requirement), and even in the analysis proposed and implemented by Judge Barrett in *Lundgren* or by commentators and scholars. I will demonstrate that each of these inquiries is better addressed under one or more alternative requirements for patentability.

1. Transformation

To determine whether a claimed invention is a practical application of one of the excepted categories—i.e., an abstract idea, law of nature, or natural phenomenon—the examiner is encouraged to analyze whether “[t]he claimed invention ‘transforms’ an article or physical object to a different state or thing.”²¹⁸ In seeking to answer this question, the real inquiry is whether the claimed application is useful—a question better addressed under the § 101 utility doctrine. This crossover of ideas is clear even from the 2005 Guidelines themselves: “[Transformation is] one example of how a mathematical algorithm . . . may bring about a *useful* application.”²¹⁹ This conflation may be a holdover from some unfortunate language used in *State Street*.²²⁰ However, it is equally clear that utility and subject-matter

214. Nor is it limited to software-related inventions, although its occurrence is particularly rampant for that type of invention.

215. *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1364 (2005) (Gajarsa, J., concurring).

216. *Id.* at 1342.

217. *Id.*

218. 2005 Guidelines, *supra* note 19, at 19.

219. *Id.* at 20 (emphasis added).

220. See Rick Nydegger, *B2B, B2C and Other “Business Methods”: To Be or Not to Be Patent Eligible?*, 9 U. BALT. INTELL. PROP. L.J. 199, 209 (2001) (“The unfortunate aspect of the

eligibility are two distinct inquiries: “An invention can be statutory subject matter and be . . . devoid of any utility.”²²¹ As Professor Robert Kreiss explains, something can be “useful but not subject matter (gravity), . . . subject matter but not useful (purified chemical compositions from plants and animals with no known uses), [or neither of the above] (e-c2 and naturally occurring chemical compositions with no known uses).”²²² To hinge subject-matter utility on whether there is a *useful* application of a mathematical algorithm, law of nature, or natural phenomenon incorrectly merges two separate patent law doctrines. Although the argument of proxy inquiry is interesting in an academic way, this conflation (and others discussed below) also raises pragmatic concerns, as subject-matter eligibility and utility are subject to review by the Federal Circuit under different standards.²²³

2. Useful, Tangible, and Concrete Result

The alternative test to transformation—i.e., that the invention produces a useful, tangible, and concrete result—suffers from the same and additional flaws. For one, the 2005 Guidelines specifically tie the “useful result” prong to utility under § 101,²²⁴ which, as noted above, should be a wholly separate test. This raises two separate concerns. First, is the transformation test now, or should it be, wholly subsumed in the useful, tangible, and concrete result

[*State Street*] opinion is the troubling ambiguity introduced by the court’s reference to ‘practical utility’ . . . which leads one to wonder what the differences are between those various terms, if any, as well as whether ‘practical utility’ for purposes of determining eligibility of subject matter is the same as ‘practical utility’ for purposes of determining ‘utility’ in the classic sense as a separate requirement of patentability.”).

221. *In re Bergy*, 596 F.2d 952, 962–63 (C.C.P.A. 1979); *see also* *Diamond v. Diehr*, 450 U.S. 175, 188–91 (1981) (noting that the inquiry of whether a patent claims statutory subject matter is separate from the other requirements of patentability, including utility); 1 PETER D. ROSENBERG, *PATENT LAW FUNDAMENTALS* § 6.00, at 6-2 (2d ed. 1989) (“Statutory subject matter is a substantive criterion of patentability separate and distinct from novelty, utility, and nonobviousness.”); Kreiss, *supra* note 102, at 74–75 (arguing that both the courts and the Patent Office have erroneously confused and conflated the statutory subject matter and the requirement of eligibility).

222. Kreiss, *supra* note 102, at 75.

223. *See* Kevin Casey et al., *Standards of Appellate Review in the Federal Circuit: Substance and Semantics*, 11 FED. CIR. B.J. 279, 361 (2002) (“Statutory subject matter under [§ 101] is a question of law reviewed de novo.” (citing *AT&T Corp. v. Excel Commc’ns, Inc.*, 172 F.3d 1352, 1355 (Fed. Cir. 1999))). But, “[u]tility [under] § 101 is a question of fact reviewed for clear error or substantial evidence.” *Id.* (citing *In re Cortright*, 165 F.3d 1353, 1356 (Fed. Cir. 1999)).

224. 2005 Guidelines, *supra* note 19, at 20 (“For an invention to be ‘useful’ it must satisfy the utility requirement of section 101.”).

inquiry? Second, for either, is the question of subject-matter eligibility being used as a proxy for analyzing the utility of the claimed invention?

The requirement of concreteness similarly brings in notions that are more appropriately addressed with respect to the § 101 utility requirement. In order to be “concrete,” the 2005 Guidelines indicate that “the process must have a result that can be substantially repeatable or the process must substantially produce the same result again.”²²⁵ In fact, the guidelines cite *In re Swartz*²²⁶ for this proposition—a case which is clearly directed to the utility (not the eligible subject matter) aspect of § 101.²²⁷ Moreover, *Swartz* notes that the question of utility under § 101 also implicates issues of enablement under § 112.²²⁸ To satisfy enablement under § 112, the application must disclose the claimed invention sufficiently to allow a person having ordinary skill in the art to practice the invention without undue experimentation—the very essence of repeatability or predictability.²²⁹ The 2005 Guidelines, in requiring eligible subject matter to be repeatable or predictable, are similarly also intermingling elements of § 112 with the statutory subject-matter inquiry under § 101.

3. Other Tests

In addition to the currently favored § 101 tests discussed above, the tests that have been rejected by the courts and the Patent Office, as well as those that Judge Barrett offers up in *Lundgren* and those suggested by commentators, are just as problematic with respect to serving as proxies for other difficult determinations.

a. Machine Implementation

The now-disfavored machine implementation test questioned whether the claim recited a process implemented by a machine.²³⁰ The test was rejected because, based on *Gottschalk v. Benson*, a machine-implemented process that is wholly directed to an abstract idea is not eligible subject matter.²³¹ However, the real question behind this test is how the process

225. *Id.* at 22.

226. 232 F.3d 862 (Fed. Cir. 2000).

227. *Id.* at 863–64 (denying Mr. Swartz’s application for a cold fusion invention, noting that the invention was inoperable and irreproducible).

228. *Id.*

229. See 35 U.S.C. § 112 (2000).

230. 2005 Guidelines, *supra* note 19, at 48–49.

231. *Id.* (citing *Gottschalk v. Benson*, 409 U.S. 63 (1972), *In re Schrader*, 22 F.3d 290, 292–93 (Fed. Cir. 1994), and *In re Grams*, 888 F.2d 835, 841 (Fed. Cir. 1989)).

happens; the proper inquiry is then under § 112—did the applicant fully describe and enable his invention? It follows that, if the applicant does not describe how the process is to be implemented, via machine or otherwise, the applicant has failed to satisfy the enablement or written-description requirements. If the process is not implemented by machine (or we are otherwise unable to determine how to replicate the process on our own), then the invention should be rejected under § 112, rather than the proxy § 101.

b. Mental Steps

Similarly, the courts and the Patent Office have rejected the mental steps test because the presence of a step that may be performed by a human is not fatal to patentability.²³² However, this test may be experiencing a revival, as evidenced by the Federal Circuit’s opinion in *In re Comiskey*, where the court stated that “mental processes—or processes of human thinking—standing alone are not patentable even if they have practical application.”²³³ This test is most likely a proxy for the enablement requirement of § 112. A process that includes many mental steps will be much more difficult to adequately describe at the level required to enable a person having ordinary skill in the art, leading to a rejection under § 112. It is likely more difficult to describe how to perform a step that takes place mentally, leading to issues of lack of enablement. In fact, the Federal Circuit essentially admitted as much in acknowledging the subject-matter eligibility of the claims directed to the very same steps, but tied to specific machinery (that is, those requiring a computer), and rejecting subject-matter eligibility to those claims that were not tied to a specific machine (or did not explicitly require a computer).²³⁴ However, this is a separate inquiry from subject-matter eligibility and should not be inserted into the application examination at this point.

c. Proposals from Judge Barrett

Judge Barrett, after reviewing the case law in detail, suggests that there are three possible tests for statutory subject matter of software-related

232. See 2005 Guidelines, *supra* note 19, at 47 (citing *Alco Standard Corp. v. Tenn. Valley Auth.*, 808 F.2d 1490, 1496 (Fed. Cir. 1987)).

233. *In re Comiskey*, 499 F.3d 1365, 1377 (Fed. Cir. 2007).

234. See *id.* at 1379 (“When an unpatentable mental process is combined with a machine, the combination may produce patentable subject matter.”).

inventions where a machine does not implement the process.²³⁵ These tests are the transformation test, the judicial-exception test, and the “useful, concrete and tangible result” test.²³⁶ The analysis of the proxy-type status of the “useful, concrete and tangible result” test is discussed above. The judicial-exception test is not a proxy-type inquiry per se but may implicate the same confusion between the two prongs of the § 101 analysis, as noted above. Judge Barrett’s proposals for the “transformation” test, as well as the element of physicality that runs through his analysis, however, do raise additional proxy-type inquiry concerns.

Interestingly, when Judge Barrett applies the “transformation” test, the test becomes a proxy, not for § 101 utility as analyzed above, but for § 112 enablement. In his application of the test, Judge Barrett notes that the claim “does not recite how the steps are implemented” and that the steps “are broad enough to be performed without a machine.”²³⁷ These concerns sound more like issues to be raised under § 112 enablement, similar to the discussion provided for the now-excised machine implementation test.²³⁸ Section 101 is not the proper inquiry for whether the applicant describes how or with what to perform the steps.

Throughout all of his analyses, Judge Barrett focuses on physicality as a prerequisite to subject-matter eligibility. For example, he states that certain steps of the claimed process “[do] not recite any physical implementation” or “since no machine is claimed, are disembodied.”²³⁹ Overall, the claimed invention does not apply “natural science or engineering knowledge to physical structure or to physical acts which transform physical subject matter . . . to a different state.”²⁴⁰ Finally, a concrete and tangible result “requires some sort of physical instantiation.”²⁴¹ This focus on physicality, which is present to some extent in the 2005 Guidelines, can also be a proxy-type inquiry for a concern more appropriately addressed under § 112, where a structural component or other description of implementation becomes essential.

235. *Ex parte* Lundgren, B.P.A.I. No. 2003-2088, 76 U.S.P.Q.2d 1385, 1429–30 (Sept. 28, 2005) (Barrett, J., dissenting). Note, too, that Judge Barrett’s preamble to his possible tests implicates an already-rejected test—machine implementation. *See id.* at 1430.

236. *Id.* Judge Barrett also notes that the technological arts test is a possibility, but rejects it and discusses it no further. *Id.* at 1424–26.

237. *Id.* at 1418, 1430.

238. *See supra* Part IV.C.3.a.

239. *Ex parte* Lundgren, 76 U.S.P.Q.2d at 1430.

240. *Id.* at 1431.

241. *Id.* at 1432.

d. *Proposals from Commentators*

Commentators have also recognized the confusion arising out of case precedent and Patent Office practice and have struggled with the question of the appropriate test for eligible subject matter under § 101. However, even commentators who are sympathetic to software-related inventions have tended to import proxy-type inquiries into the analyses.

For example, Professor Richard Gruner proposes a set of criteria for determining eligible subject matter that considers the following features: 1) an invention fills a user's need with identifiable value, 2) the need is shared by more than a few potential users, 3) the invention produces regular and consistent results, and 4) the invention can be described clearly and succinctly.²⁴² Unfortunately, each of these criteria represents a proxy-type inquiry that is unrelated to the real question of § 101 eligible subject matter. The first three inquiries—filling a need that is valuable to multiple people and regular and repeatable—are all more aptly addressed under § 101 utility, not subject-matter eligibility. Similarly, the fourth inquiry, ability to be described clearly, is without question an inquiry for § 112's written description requirement. None of these goes to the heart of the question about subject-matter eligibility.

These proxy-type inquiries are not and should not be part of the subject-matter eligibility requirement. There is a time and a place for each of these concerns to be addressed—indeed, the 2005 Guidelines remark that, after subject-matter eligibility is ascertained, the next steps of examination are to establish patentability under §§ 112, 102, and 103. By instead addressing these other, possibly more difficult, issues at the threshold stage, the Patent Office is openly displaying its opposition towards the patent eligibility of computer-related inventions. Because members of the Supreme Court have also indicated their hesitancy to provide patent protection to software and business method inventions, it is possible the Supreme Court will make similar mistakes when it addresses the issue. In fact, Justice Breyer's dissent in *LabCorp* has overtones of the same proxy-type inquiries. For example, when Justice Breyer complains that the claim term “assaying a body fluid” refers to “any test at all,”²⁴³ the true underlying concern is that of § 112 enablement, not § 101.

242. See Gruner, *supra* note 107, at 451–53.

243. *Lab. Corp. of Am. Holdings v. Metabolite Labs, Inc.*, 126 S. Ct. 2921, 2924 (2006) (Breyer, J., dissenting).

V. AN APPROPRIATE PROCESS FOR EXAMINING PATENT APPLICATIONS
CONCERNING COMPUTER-RELATED INVENTIONS

Whether the statutory subject-matter analysis is being performed by the Patent Office, the Supreme Court, or the Federal Circuit, it is important that the correct questions are asked and that any proxy-type inquiry be removed from the determination. This will ensure that § 101 and statutory subject matter will be given their widest berth, in line with constitutional mandate and judicial precedent. Most importantly, the question of subject-matter eligibility must be given only its due weight—either it is patentable subject matter or it is not.²⁴⁴ The nature of the invention should not bear on the analysis, but only the answer. Computer-related inventions should not be treated differently than any other type of invention; identical treatment will simplify the process and guarantee that proxy-type inquiries are not providing an easy way to avoid the issuing of software patents.

The correct process is simple. A Patent Office examiner should first seek to determine what the applicant has invented and is seeking to patent. Based on that understanding, the examiner should determine whether the claimed invention complies with the subject-matter eligibility requirement of § 101. In doing so, the examiner should be aware of the breadth of § 101, should determine whether the invention fits within at least one of the enumerated categories of § 101 (process, machine, manufacture, or composition of matter), and should determine whether the invention fits within one of the judicial exceptions to § 101 (law of nature, natural phenomenon, or abstract idea).²⁴⁵ Very few, if any, inventions will not fit within one of the enumerated statutory categories; most inventions will thus pass this threshold inquiry and then be subjected to the remaining statutory requirements for patentability.

However, there will still be a certain number of cases that fall within one of the judicial exceptions to statutory subject matter. In these, it is not simply enough to determine whether an invention includes one of these three judicial exceptions. Rather, if the sole invention is a natural phenomenon, law of nature, or abstract idea, then it is not eligible for patenting. To state the idea another way, the relevant question is whether the claimed invention would preempt all uses of the abstract idea, law of nature, or natural phenomenon.

244. *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1342 (Fed. Cir. 2005) (“Either the subject matter falls within Section 101 or it does not.” (quoting *Animal Legal Def. Fund v. Quiss*, 932 F.2d 920, 929–30 (Fed. Cir. 1991))).

245. *See In re Nuijten*, 500 F.3d 1346, 1354 (Fed. Cir. 2007) (“The four categories together describe the exclusive reach of patentable subject matter.”).

All other inquiries are irrelevant to an analysis of eligible subject matter under § 101. If the invention fits within one of the four categories, and does not fit within any of the three exceptions, it is patent-eligible subject matter. This is the whole extent of the § 101 subject-matter eligibility question, no more and no less. Whether the invention is patentable, however, still must be determined by applying the criteria for utility, novelty, nonobviousness, and adequate description as provided by §§ 101, 102, 103, and 112.²⁴⁶ These inquiries, not the initial threshold stage, present the appropriate time to make such determinations.

The question of subject-matter eligibility under § 101 for software-related inventions should be no different from the same inquiry for an invention in another field, say a fuel cell or a chemical compound for cleaning or a method for manufacturing a stronger synthetic fabric. Each of these inventions, and countless others, would not raise a hint of a question with respect to subject-matter eligibility; the same treatment must be given to software applications. It is incumbent on the courts and the Patent Office to realize that treating software inventions differently is an artifact of prior hostility and a means to avoid difficult questions at the examination stage—neither of these justifies a heightened inquiry into subject-matter eligibility.

VI. CONCLUSION

When it comes to determinations of subject-matter eligibility for software-related patent applications, the Patent Office is truly firing an elephant gun at an ant. In nearly every situation, software-related inventions should be deemed statutory subject matter under § 101 without additional thought or inquiry, just like every other type of invention. Software is a “useful art” under the constitutional mandate and is a “process” under § 101. This issue should take up no more of our attention; the eligibility of software-related inventions should be treated like the ant-sized issue it is.

The Patent Office Guidelines approach this simple issue of subject-matter eligibility for software-related inventions with a rather unnecessary elephant gun. The guidelines impose additional inquiries for software applications that appear to be a remnant of the courts’ and Patent Office’s longstanding hostility towards these inventions or a reaction to the public’s disapproval of the Patent Office’s recent performance. Moreover, the guidelines themselves, the tests that have been recently rejected, and other

246. Admittedly, the long history when software-related inventions were considered to be ineligible subject matter (along with other factors) has resulted in a very small body of prior art against which to examine these applications. However, this is not a subject properly addressed via § 101, and its solution is a topic for another day.

proposals for determining the patent eligibility of software inventions all include elements that would best be addressed through other patentability requirements, such as utility, written description, novelty, or obviousness—all of which are not threshold issues and all of which serve other purposes.

If we continue to let the Patent Office reject these applications at early stages, under the guise of lack of eligible subject matter, patenting in the software-related inventions will suffer, and progress of the useful arts will be hampered, not promoted. When the Supreme Court addresses this issue, and should it follow the same path of analysis, it too will be misguided, and the result will be harmful to software innovation. To avoid this and continue the level of vibrant creativity in this field, the Patent Office and the courts must stop treating these applications differently. There should be no extra levels of inquiries for these inventions. Rather, the inquiry must be limited to this: 1) does the invention fit within one of the four enumerated categories of § 101; 2) does the invention fall under one of three judicial exceptions; and 3) if the invention does fall under one of the three judicial exceptions, would the grant of a patent monopoly result in the preemption of the mathematical algorithm, law of nature, or natural phenomenon. The Constitution and the Patent Act call for nothing more and nothing less—and the future of software innovation requires this change.